

REMARKS

The Abstract has been replaced. Claims 42, 49 and 54 have been canceled, and new claims 55 and 56 have been added. Claims 28, 43, 45, 48, 50 and 53 have been amended. Thus, claims 28-41, 43-48 and 50-53 and 55-56 are now pending in the present application. No new matter has been added. In view of the above amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable.

The Examiner has objected to the Abstract, the Title and claim 43. Amendments have been made to the Abstract and claim 43 addressing the Examiner's objections. With regard to the Title, the Examiner states that it is too broad. However, claim 28 is directed to a bus station which includes a bus monitor performing a monitoring function. Thus, Applicants are unclear as to how the Title is too broad.

Claims 28-41, 47, 48 and 50-53 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,108,782 to Fletcher et al. ("Fletcher").

Claim 28 recites a bus station performing a primary function and adapted to be coupled to a bus system comprising "at least one bus interface communicating with the bus system" in combination with "a bus monitor arrangement coupled to the bus interface" and "wherein the primary function of the bus station is one of a sensor function and an actuator function" and "wherein the bus station performs a secondary function different from the primary function using the bus monitor arrangement, the secondary function including at least one of: monitoring a communication between the bus station and the bus system via the bus interface and monitoring an internal communication within the bus station."

In contrast, Fletcher describes a distributed remote monitoring (dRMON) of network traffic and performance within a telecommunications network. Thus, it is respectfully submitted that Fletcher does not disclose or suggest that "the primary function of the bus station is one of a

sensor function and an actuator function,” as recited in claim 28. Therefore, claim 28 is allowable. Because claims 29-41 and 47 depend from, and, therefore include all of the limitations of claim 28, it is respectfully submitted that these claims are also allowable.

Independent claims 48, 50 and 53 include limitations substantially similar to claim 28, including “wherein the primary function of the bus station is one of a sensor function and an actuator function.” Thus, it is respectfully submitted that these claims are allowable for at least the reasons stated above with reference to claim 28. Because claims 51 and 52 depend from, and, therefore include all of the limitations of claim 50, it is respectfully submitted that these claims are also allowable.

Claims 42-46, 49 and 54 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Fletcher.

Initially, it should be noted that independent claims 28, 48 and 53 were amended to include the subject matter of dependent claims 42, 49 and 54, respectively. Independent claim 50 was amended to incorporate a limitation substantially similar to those included in dependent claims 42, 49 and 54. Thus, the rejection of claims 42, 49 and 54 applies to amended independent claims 28, 48 and 53, respectively.

Applicants respectfully submit that a man or woman skilled in the art would not take into consideration a document from the telecommunication and data communication area for finding a solution in the measurement area, in particular to find a better monitoring function for a sensor and an actuator. The present invention does not monitor different layers of a telecommunication and data communication protocol as described in Fletcher. *Fletcher*, col. 4, lines 55-67; col. 6, lines 10-16. In contrast to Fletcher, the present invention uses a measurement bus system which applies a measurement protocol like Fieldbus Foundation, HART, Profibus or VBUS.

The present invention relates to the monitoring of a communication between a sensor and an actuator and a control unit. The sensor, the actor and the control unit communicate with a Fieldbus Foundation, HART, Profibus or VBUS. The present invention also relates to the evaluation of measuring values. It is known that protocols from the family of Fieldbus protocols, e.g. the HART, Profibus, or VBUS protocol, are not protocols from the telecommunication area. Thus, it is respectfully submitted that the skilled person does not take into account Fletcher when finding a solution for the problem which is solved by the present invention.

The apparatus disclosed in Fletcher is used to optimize the performance of a communication network. *Fletcher*, col. 5, lines 38-40. According to the present invention, there is a strict differentiation between a Fieldbus system 5 and a second bus system 40 which is a common data communication protocol, for example the Ethernet or Internet protocol. This shows that the present invention does not relate to a conventional data network. Instead, it relates to a communication connection in the measurement area.

Problems the expert is confronted with in the measurement area clearly differ from problems concerning data and voice communication networks. One example for the different character of a measurement network using the HART bus system is that in the HART bus system measurement values also could be represented as analog signals. Data communication networks usually use digital or digitized information to exchange information. Therefore, the mechanisms known from data communication networks cannot be assumed to be obvious to a person skilled in the art. Therefore, the expert would not take Fletcher into consideration for finding a solution for a better data exchange between measurement devices.

The bus monitor is directly connected to a Fieldbus system and uses a Fieldbus protocol for communication, for example the Fieldbus, the HART Bus, the Profibus or VBUS protocol.

Since there is a difference between the communication protocols used in a Fieldbus system and a communication network, a gateway as disclosed in the present invention has to be

used in order to connect a measurement network and a data network. The gateway comprises two bus interfaces adapted for the relevant network. For each network it has a different communication software. Communication between both incompatible bus systems 5, 40 is only possible after sophisticated translations of commands.

By using the gateway, the data network can be used for transmitting the measurement values from the measurement network to the data network. However, the data network is not able to monitor the measurement network. A barrier exists between both different networks concerning the interpretation of commands. The communication network is more or less transparent for the signals distributed by the measurement network. In other words, the data communication network can be used to transport information of the measurement network, but it cannot monitor the information as the data communication network cannot interpret the measurement bus commands.

A sensor, in particular a filling level measurement device, a pressure measuring device or a temperature measuring device has the primary function to detect physical processes and to convert the detected results into electrical or digital signals. An actuator converts electrical commands into physical processes like a force.

Therefore, it is respectfully submitted that it is not obvious that bus stations perform in addition to their primary function, for example the primary function of detecting physical processes, and to convert the detected results into electrical or digital signals, a secondary function like monitoring the bus system. Such an integrated bus monitor is able to monitor external Fieldbus protocol signals and it is also able to monitor internal functions of the sensor or actuator.

The purpose of the apparatus disclosed by Fletcher is to monitor the quality of a network, i.e. performance statistics of the communication network. The bus station of the present invention determines monitor information to analyze a measurement process. Therefore, the

present invention differentiates between the transfer of measurement values on the one hand and the primary process, for example the measurement process on the other hand. Therefore, the present invention combines a primary function taken from the measurement area with a secondary function including at least one of monitoring a communication between the bus station and the bus system via the bus interface and monitoring an internal communication within the bus station. It is respectfully submitted that this combination is not obvious to a skilled person starting from Fletcher.

Applicants respectfully submit that claims 28, 48 and 53, which are amended to include the limitations of claims 42, 49 and 54, are not obvious in view of Fletcher. Because claims 43-46 depend from, and, therefore include all of the limitations of claim 28, it is respectfully submitted that these claims are also allowable.

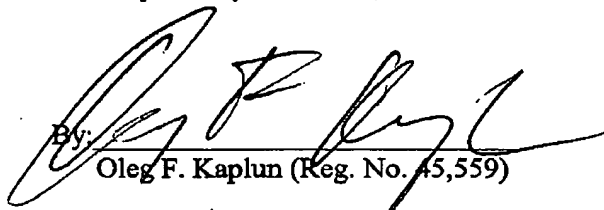
Applicants respectfully submit that the subject matter recited in new claims 55-56 are neither anticipated by nor unpatentable over Fletcher. That is, Fletcher does not disclose or suggest that its intermediate systems monitor network traffic and generate measurement data. Thus, it is respectfully submitted that claims 55 and 56 are allowable.

CONCLUSION

In light of the foregoing, Applicants respectfully submit that all of the pending claims are in condition for allowance. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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